**Annexure- II**

**NOTIFICATION NO. 11/2019**

**SCHEME AND SYLLABUS FOR THE POST OF *SERICULTURE OFFICER IN A.P SERICULTURE SERVICE***

**SCHEME**

**(DEGREE STANDARD)**

| Written Examination (Objective Type) | | | | |
|---|---|---|---|---|
| PART - A | Subject | No. Of Questions | Durations | Maximum Marks |
| Paper - I | General Studied & Mental Ability | 150 | 150 | 150 |
| Paper - II | Sericulture - I | 150 | 150 | 150 |
| Paper - III | Sericulture – II (Agriculture And Biosciences) | 150 | 150 | 150 |
| Total | | | | 450 |
| PART - B | Interview | | | 50 |
| **N.B.:** As per G.O.Ms. No.235 Finance (HR-1, Plg & Policy) Dept, Dt: 06/12/2016, for each wrong answer will be penalized with 1/3rd of the marks prescribed for the question. | | | | |

**Syllabus**

**PAPER-I: GENERAL STUDIES AND MENTAL ABILITY**

1. Events of national and international importance.
2. Current affairs- international, national and regional.
3. General Science and it applications to the day to day life Contemporary developments in Science & Technology and information Technology.
4. Social- economic and political history of modern India with emphasis on Andhra Pradesh.
5. Indian polity and governance: constitutional issues, public policy, reforms and e-governance initiatives with specific reference to Andhra Pradesh.
6. Economic development in India since independence with emphasis on Andhra Pradesh.
7. Physical geography of Indian sub-continent and Andhra Pradesh.
8. Disaster management: vulnerability profile, prevention and mitigation strategies,
   Application of Remote Sensing and GIS in the assessment of Disaster.
9. Sustainable Development and Environmental Protection
10. Logical reasoning, analytical ability and data interpretation.
11. Data Analysis:
    a) Tabulation of data
    b) Visual representation of data
    c) Basic data analysis (Summary Statistics such as mean, median, mode, variance and coefficient of variation) and Interpretation
12. Bifurcation of Andhra Pradesh and its Administrative, Economic, Social, Cultural, Political, and Legal implications/problems.

## PAPER-II

## SERICULTURE – I

1. **GENERAL INTRODUCTION TO SERICULTURE AND ITS DISTRIBUTION IN INDIA**.

Types of silk produced in India- Status of mulberry and non-mulberry Sericulture in India and at Global level- Economic importance - Scope of Sericulture in India- Employment potential and income generation of sericulture industry- History of Sericulture

**2. MULBERRY CULTIVATION**

Taxonomy and morphology of mulberry - Mulberry classification -Varieties and their distribution.
Mulberry cultivation practices under irrigated and rainfed conditions and schedule of package of practices
Suitable soils- Location and climate for mulberry cultivation
Mulberry propagation: Sexual and Vegetative propagation
Cuttings: Preparation of Cuttings - Raising of nurseries
Grafting: Stem - Root - Bud grafting techniques
Layering: Ground- Air- Trench layering methods
Planting systems: Row system- Pit system -Paired row system
Fertilizer schedules for irrigated and raifed mulberry gardens
Pruning: Objectives and methods
Harvesting- Transportation - Preservation of mulberry leaves.

3. **DISEASES AND PESTS OF MULBERRY**

Diseases: General account of mulberry diseases - Foliar diseases - Root diseases - Stem diseases – Causes – Symptoms-Preventive and control measures
Deficiency diseases – Causes – Symptoms-Preventive and control measures
Nematodes infesting mulberry- Occurrence- Distribution- Crop loss- Preventive and control measures
Pests: Leaf hoppers- Scale insects- Mealy bugs- White flies- Hairy caterpillars- Leaf cutters- Termites- Distribution- Signs of attack- Crop losses –Preventive and control measures - Integrated pest management (IPM)

**4. SILKWORM BIOLOGY AND PHYSIOLOGY**

Systematic position of mulberry silkworm- External morphology of silkworm-Egg, Larva, Pupa and Adult - Embryology-Structure of Egg-Fertilization-Cleavage-Blastoderm-Germ band formation-Blastokinesis-Involution of the embryo
Physiology of Digestion-Respiration-Circulation-Excretion-Glandular system- Reproduction

**5. PREPARATION FOR SILKWORM REARING**

Number of cocoon crops per year – Silkworm races - Model rearing house – Different types of rearing houses – Rearing appliances - Sanitation – Importance and methods of disinfection – Different disinfectants – Bed disinfectants

**6. REARING TECHNOLOGIES**

Chawki Rearing Concept: Procurement silkworm eggs – Incubation – Black Boxing - Brushing of silkworms – Young age silkworm rearing technology - Late age silkworm rearing technology - Cleaning - Spacing -Objectives of spacing – Optimum spacing for different ages – Care during molting - Feeding behavior –Frequency- Preservation and quantity of mulberry leaf – Artificial diet - Environmental factors – Optimum conditions – Devices to control temperature and humidity.
Mounting and spinning: Methods of mounting – Types of mountages – Population Density – Care during mounting spinning process – Harvesting of Cocoons – Time of Harvest – Cocoon sorting – Assessment – Transportation and Marketing.

**7. SILK WORM EGG PRODUCTION**

Marketing of seed cocoons and price fixing- Silkworm seed organization and its significance (bivoltine and multivoltine).
Grainage operations: Procurement and preservation of seed cocoons- Sex separation- Moth emergence- Mating- Oviposition – Sheet and loose egg preparation - Packing and sale of eggs - Mother moth examination- Surface sterilization of eggs- Acid treatment of hibernating eggs - Embryonic growth - Hibernating (Diapausing) eggs - Techniques of cold storage of eggs - Artificial hatching

**8. SILKWORM DISEASES**

Types of diseases – Etiology – Viral diseases : Nuclear polyhedrosis – Cytoplasmic polyhedrosis – Infectious flacherie – Densonucleosis – Causative agents – Symptomology-Prophylactic measures
Bacterial diseases: Bacterial diseases of digestive tract-Bacterial septicemia – Toxicosis – Causative agents- Symptomology- Prophylactic measures
Fungal diseases: White muscardine – Types – Causative agents – Life Cycle – Symptomology-Prophylactic measures
Protozoan diseases: Pebrine – History Causative agent – Life Cycle – Mode of Transmission – Symptomology- Prophylactic measures

**9. PESTS OF SILKWORM**

Pests of Silkworm: Uzi fly – Classification - Morphology and life cycle of the parasitoid –Extent of crop loss – Management of Uzi fly menace – Dermested beetles – Life Cycle and control

**10. COCOON ASSESSMENT AND PROCESSING TECHNOLOGIES**

Cocoon properties-Assessment –Types of defective cocoon - Shell percentage -Shell ratio - Filament length - Denier - Renditta- Raw silk percentage. Cocoon stifling /drying- Objectives - Cocoon storage and preservation of cocoon in silk reeling units-Cocoon boiling/cooking- Different methods

**11. SILK REELING TECHNOLOGY**

Silk reeling: Country charakha- Improved charakha - Cottage basin – Multiend- Semi automatic - Automatic reeling machines - Passage of thread in various reeling machines- Functions of components of reeling machines- Reeling basin- Jettebout-Porcelein button- Croissure- Chambon type and tavellette type- Guide pulley -Tension pulley- Traverse mechanism- Reel- Swift- Reel stop motion- Denier control device-Re reeling

**12. SILK TESTING AND SPUN SILK PROCESSING**

Raw silk testing- Visual and mechanical tests - Winding test- Size test- Tenacity- Elongation test- Evenness, cleanness and neatness tests- Cohesion, Testing and grading -Spun silk industry- Raw materials- Processing at different stages of spun silk fibers

**13. NON-MULBERRY SERICULTURE**

Introduction to Eri, Tasar and Muga culture- Distribution – Classification and Life cycle of Eri, Tasar and Muga- Primary and secondary food plants of Eri, Tasar and Muga silkworms- Geographical distribution - Cocoon production technology – Disinfection – Incubation-Young age silkworm rearing -Late age silkworm rearing– Spinning- Harvesting

**14. VALUE ADDED PRODUCTS OF MULBERRY AND SILKWORM**

Value-adding Potentials in mulberry: Chemical composition of mulberry leaf and fruit -Nutritional and medicinal values of mulberry –Other uses- value-adding potentials in seed and cocoon production –Nutritional value of Silkworm and silkmoth- Cocoon and silk art craft application - Silkworm as biotechnological and laboratory tool.

**15. VALUE ADDED PRODUCTS OF SILK**

Types of silk wastes – Spun silk- Noil yarn and its utility - Silkworm pupae as food material and its nutritional value - Pupal oil extraction and its uses-Defective and double cocoons for production of dupion silk- Application of silk protein- Fibroin and sericin as biomaterials- Pharmaceutical-Biomedical application- Cosmetic application

## PAPER-III
## SERICULTURE - II

## ( AGRICULTURE AND BIOSCIENCES )

**1. PRINCIPLES OF AGRONOMY**

Agriculture in India - Indian economy – National income – Per capita income –Agricultural income in GDP -Different agro climatic Zones of India and Andhra Pradesh - Crops and major soils - Classification – Economic and agricultural importance in India and Andhra Pradesh

**2. PRINCIPLES OF SOIL SCIENCE**

Soils of Andhra Pradesh - Major soil types- Characteristics and their distribution Problematic soils and their management: Acid and saline soils and methods of reclamation

**3. MANURES AND FERTILIZERS**

Organic manures and their applications: Farm yard manure-Compost-Vermicompost-Oil cakes, Methods of compost and vermicompost preparations.

Green manuring: Green manure crops and their relevance in soil productivity.

Chemical fertilizers: Classification- Composition - Properties of major Nitrogenous, Phosphatic and potassic fertilizers, Secondary and micronutrient fertilizers, Complex fertilizers, Nano fertilizers.

Foliar nutrition: Foliar nutrient formulations- Mode of applications- Merits and demerits.

Bio fertilizers: Types: Nitrogen- Phosphate -Cellulolytic- Biological nitrogen fixation Importance-Applications and limitations

**4. IRRIGATION AND WATER MANAGEMENT**

Importance of water - Water resources in India-Water sources- Water quality- Area under irrigation in Andhra Pradesh

Crop water requirements - Water management practices - Methods of irrigation- Suitability - Limitations.

**5. WEED MANAGEMENT**

Harmful effects of weeds - Herbicides - Advantages and limitations of herbicide usage in India - Selectivity of herbicides - Herbicides and their interaction with fertilizer

Preventive and control methods: Physical-Chemical- Biological weed management techniques, Integrated weed management

**6. STRUCTURAL ORGANIZATION OF PLANT CELLS**

Ultra structure of plant cell- Structure of cell organelles and function

Tissue systems in plants – Origin- Structure, and function of simple and complex tissues, Cell cycle- Mitosis and Meiosis.

**7. PHOTOSYNTHESIS**

**S**tructure and function of Chloroplast- Photosynthetic pigments and their characteristics - Photosynthetic carbon assimilation in $C_3$, $C_4$ and CAM Plants- Photorespiration- Mechanism and regulation.

**8. RESPIRATION**

Glycolysis- Tricarboxylic Acid Cycle (TCA cycle) - Electron transport- Pentose phosphate pathway- Mechanism and Significance

**9. PLANT DEVELOPMENT AND GROWTH REGULATORS**

Pattern of plant growth and development- Growth kinetics- Morphogenesis- Principles of differentiation

Natural and Synthetic growth regulators: Auxins- Gibberelins- Cytokinins- Abscisic acid- Ethylene- Brassino steroids- Polyamines-Jasmonic acid -Salicylic acid.

**10. PLANT TISSUE CULTURE**

Preparatory techniques – Cleaning- Sterilization - Media –Types and Composition, Callus - Growth pattern/characteristics, Organogenesis and plant regeneration, Acclimatization

Somatic embryogenesis-Anther- Endosperm- Pollen cultures-Significance and advantages of haploid plants- Production of virus-free plants.

**11. STRUCTURAL ORGANIZATION OF ANIMAL CELLS**

Cell Membrane structure and function - Structural organization and function of intracellular organelles: Cytoplasm - Nucleus - Mitochondria- Endoplasmic reticulum - Golgi apparatus- Ribosomes - Lysosomes - Peroxisomes -Vacuoles - Structure and function of cytoskeleton and its role in motility

Cell division and cell cycle

**12. ANIMAL PHYSIOLOGY**

Digestion: Functional anatomy of digestive system - Digestion and digestive secretions - Absorption – Assimilation

Respiratory system - Transport of gases- Exchange of gases - Respiratory quotient - Respiratory Pigments - Waste elimination.

Nervous system – Neurons- Action potential - Gross neuroanatomy of the brain and spinal cord- Central and peripheral nervous system- Neural control of muscle tone and posture - Sense organs.

Circulatory System: Physiology of heartbeat- Blood and circulation - Blood corpuscles- Haemopoiesis - Plasma function - Blood volume - Blood groups - Haemoglobin - Immunity - Haemostasis.

Excretory system - Physiology of excretion - Formation of nitrogenous excretory products -Ammonia - Urea - Uric acid - Waste elimination -Regulation of water balance

Endocrinology and reproduction - Endocrine glands and its secretion - Reproductive processes- Gametogenesis- Ovulation- Neuro-endocrine regulation.

**13. BIOMOLECULES**

Carbohydrates: Structure- Properties - Classification - Pathways of metabolism of glucose- Glycogenesis- Glycogenolysis- Glycolysis-Citric acid cycle- Gluconeogenesis- HMP pathway-Uronic acid pathway

Proteins: Structure- Classification and properties -Aminoacids- Structure- Classification and properties

Lipids: Structure-Chemical nature-Classification- Biological functions

Nucleic acids: Types - Functions - Structure of DNA and RNA - DNA synthesis RNA synthesis (Transcription) - Protein synthesis (Translation)

**14. ENVIRONMENTAL BIOLOGY**

General account on biomes and their environment

Fresh water: Classification and characteristics of freshwater bodies-Eutrophication-Seasonal changes

Marine: Classification and Characteristics- Shores and Estuaries

Terrestrial: Forests- Grasslands- Tundra- Mountains -Caves.

Ecology: Components of an Ecosystem - Tropic levels - Food chain and food web - Energy flow in ecosystem.

**15. ENVIRONMENTAL POLLUTION**

Kinds of pollution- Air pollution: Criteria and standards in India-Health hazards and toxicology-Green house effect-Acid rains-International conventions on ozone-Climate-

Water pollution: Criteria and standards-Waste - Water treatment – Microbial ecology of Activated Sludge-Modern methods of waste water treatment - Solid waste treatment -Noise Pollution-Radiation Pollution - Global environmental change - Ecological effects of pollution-Monitoring pollution - Remote Sensing as a tool for study and management of environment.

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